



Mosquito-Borne Viruses in Georgia, 2008

Human Arbovirus Surveillance

West Nile virus (WNV) is a mosquito-borne viral pathogen that was introduced into the United States in 1999. Within four years following its initial detection in New York, WNV was detected in states from the East and West coasts as well as in Mexico and Canada. In Georgia, the virus was first identified in 2001. WNV is now considered endemic in most parts of the U.S., including Georgia.

West Nile virus is maintained in birds. It occasionally infects humans who are bitten by mosquitoes that have been feeding on birds. Most people (approximately 80%) infected with WNV do not develop symptoms. About one in five infected persons experiences a mild illness, often termed “West Nile Fever” (WNF), characterized by fever, headache, muscle weakness or myalgia, arthralgia, and sometimes rash. Less than one percent of persons infected with WNV develop neurologic illness (“West Nile Neurologic Disease”

Figure 1. Human Arboviral Cases, by Month of Onset, Georgia 2008

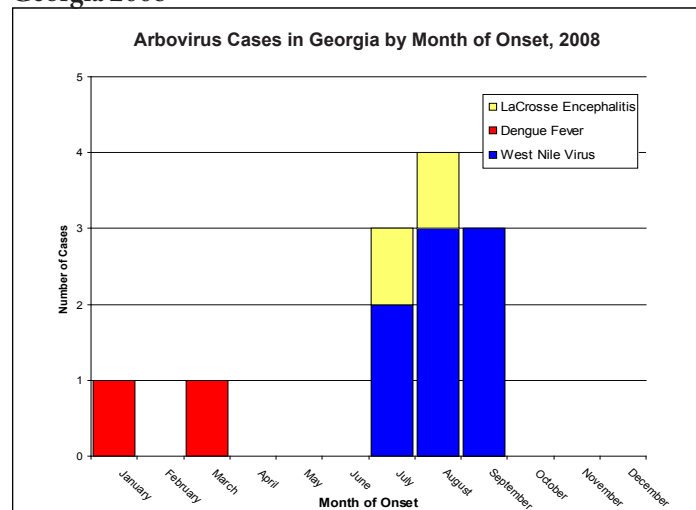


Table 1. Arbovirus Cases by County of Residence, Georgia 2008

Arbovirus	Month of Onset	County of Residence	Clinical Syndrome	Fatality
DENGUE	January	Gwinnett	Fever	No
DENGUE	March	Cobb	Fever	No
LAC	July	Lowndes	Encephalitis	No
LAC	August	Forsyth	Encephalitis	No
WNV	July	Lee	Fever	No
WNV	July	Dougherty	Fever	No
WNV	August	Fulton	Altered Mental Status	No
WNV	August	Floyd	Encephalitis	No
WNV	August	Cobb	Encephalitis	No
WNV	September	Dougherty	Fever	No
WNV	September	Floyd	Meningitis	No
WNV	September	Bibb	Encephalitis	No
WNV*	September	Gwinnett	Asymptomatic	No
WNV*	September	Lee	Asymptomatic	No
WNV*	September	DeKalb	Asymptomatic	No
WNV*	October	Forsyth	Asymptomatic	No

or WNND) in the form of meningitis, encephalitis, or possibly acute flaccid paralysis. Approximately three to fifteen percent of WNND cases are fatal. Risk of WNND is associated with increasing age and the presence of underlying medical conditions.

Nationwide, 1,338 cases of WNV illness (both WNF and WNND) and 43 deaths were reported to CDC in 2008 (as of February 13, 2009). In Georgia, an acute arboviral infection is a reportable condition; however, the majority of cases of arboviral infection remain undetected if moderate or severe illness does not develop. In 2008, Georgia reported 8 confirmed cases of WNV. Four positive viremic blood donors were also identified, but are not counted as any of the 8 confirmed cases. 5 (62%) of the 8 cases experienced WNV neurologic illness (Altered mental status, encephalitis, and/or meningitis) and 3 (38%) were diagnosed with WNV fever. The four viremic blood donors remained asymptomatic. The average age of cases was 54 years (range 23-76). The average age of those with WNV neurologic illness was 66 years (range 58-76). 7 (88%) of the 8 cases were male. As in past seasons, the majority of cases were reported in August and September (Figure 1). Dougherty and Floyd Counties both reported two WNV cases, followed by Bibb, Cobb, Fulton and Lee Counties which each reported 1 case. See Table 1 for the counties of residence of each case.

Other Mosquito-Borne Viruses in Georgia

West Nile virus is one of several mosquito-borne viruses, also called arboviruses (arthropod-borne viruses) that circulate in Georgia. Other identified arboviruses include Eastern Equine Encephalitis virus (EEE), LaCrosse virus (LAC), and rarely St. Louis encephalitis virus (SLE), which is closely related to WNV. West Nile virus is the most commonly reported arbovirus in Georgia, although LAC infection is probably under-recognized because it usually causes only a mild clinical illness. EEE is the most severe of the arboviral infections, leading to death in 30-50% of symptomatic cases and often leaving survivors permanently disabled.

In addition to the 8 cases of WNV discussed previously, two confirmed cases LaCrosse Encephalitis were reported in Georgia in 2008.

All acute arbovirus infections are reportable in Georgia, including those that are not acquired within the United States. The Georgia Division of Public Health requires all acute arboviral infections to be reported because species of mosquitoes thrive in Georgia that are competent vectors for exotic diseases such as Dengue, Chikungunya and Yellow Fever. Although the risk of local transmission is low, it does exist. There were two internationally acquired cases of Dengue reported in 2008. Please see Table 2 for country of origin.

Table 2. Internationally Acquired Arbovirus Infections in Georgia Residents, by Country of Origin

Arbovirus Infections	Country of Origin
DENGUE	St Barts-Saint Barthelemy
DENGUE	India

Human Testing for WNV and other Arboviruses

Commercial tests to detect WNV and other arbovirus antibodies are readily available at most commercial laboratories. **During 2009, GDPH recommends that diagnostic testing for human arbovirus infections be performed at commercial laboratories.** The Georgia Public Health Laboratory (GPHL) can perform testing for serologic evidence of infection with each of the arboviruses that circulate in Georgia. GPHL does not charge for WNV and arbovirus panel tests, but due to decreased funding for arboviral testing, **specimens should only be submitted to GPHL in situations of extreme need.** Specimens will not be tested by GPHL unless they meet the criteria as listed below. Please call the Georgia Division of Public Health (404-657-2588) or the appropriate District Health Office before submitting specimens for arboviral testing to assure that the criteria are met for testing

at GPHL. If needed, specimens positive for WNV or other arboviruses at commercial laboratories can be retested at GPHL to verify the results. **Please do not submit specimens unless testing criteria are met; ineligible specimens will not be tested.**

Table 3. GPHL Arbovirus Testing Criteria for 2009

Adults: To qualify for testing at GPHL, persons must be 18 years or older and meet **at least one** of the following clinical criteria:

- Meningitis, OR
- Encephalitis, OR
- Acute onset of profound muscle weakness or acute flaccid paralysis (including Guillian-Barre syndrome), OR
- Fever (greater than 100.4°F) and **at least 2** of the following:
 - Headache
 - Malaise
 - Arthralgia
 - Fatigue
 - Eye Pain

Children: To qualify for testing at GPHL, persons must be 17 years or younger and meet **at least one** of the following clinical criteria:

- Fever (greater than 100.4°F) with ataxia or extrapyramidal signs, OR
- New onset seizures or increased seizure activity in children with pre-existing seizure disorders, OR
- Encephalitis, OR
- Acute onset of profound muscle weakness or acute flaccid paralysis (including Guillian-Barre syndrome)

Note: Because meningitis due to other causes is rather frequent among children during arbovirus transmission season, children with meningitis will not be tested unless they meet additional criteria described above, or after other bacterial and viral causes have been ruled out.

For more information regarding arbovirus activity in Georgia, please visit <http://health.state.ga.us/epi/vbd/mosquito.asp> or call 404-657-2588.

Arbovirus Surveillance in Sentinel Species

In addition to surveillance for human disease caused by arboviruses in Georgia, GDPH and its partners conduct surveillance for arboviruses in horses, birds, and mosquitoes in an effort to determine local risk of human disease. However, decreased funding will make it less likely that arboviral surveillance programs will be sustainable. Below is a summary of arbovirus surveillance results in 2008.

Bird Surveillance

The number of birds being submitted for testing has continued to decrease, and dead bird surveillance appears to be losing ground as a surveillance tool, especially where mosquito surveillance is being done. In areas where no mosquito

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surveillance occurs, bird surveillance can be useful in predicting increased risk of human disease. It is also useful for providing a trigger for public health messages concerning personal protection measures to take to lower the risk of mosquito-borne diseases.

Horse Surveillance

No horses had laboratory confirmed WNV infections in 2008. Twenty-three horses and 1 dog had laboratory confirmed EEE infections, indicating an elevated risk for EEE locally. Horse surveillance has been useful in rural counties where bird and mosquito surveillance resources are few. However, reduced disease reporting for horses, due to increased immunity, increased vaccination, and decreased interest in testing, makes this surveillance system less useful as a sentinel for determining increasing human disease risk.

Like humans, horses are incidental hosts for WNV and other arboviral infections. Reports of positive horses in an area indicate increased human risk because mammal-biting mosquitoes are transmitting virus. Public health contacts the owners of arboviral-positive horses to educate them about their personal risk of disease and risk-reduction measures they can take on their farm to prevent future cases.

Mosquito Surveillance

Mosquito surveillance is conducted to detect the presence of arboviruses in potential vectors and to help guide and evaluate mosquito control programs. Some level of mosquito surveillance was conducted in 28 of 159 Georgia counties in 2008. In addition, the U.S. Army Center for Health Promotion and Preventive Medicine South (USA-CHPPM) conducted mosquito surveillance on military bases in Georgia, sharing those data with GDPH. Intensive mosquito surveillance was conducted in fewer than 10 counties. Five counties reported WNV-positive mosquito pools. The first positive mosquitoes were detected in metro Atlanta in early July. The last positive pool was collected in metro Atlanta in October, with peaks in numbers of positive pools occurring in August.

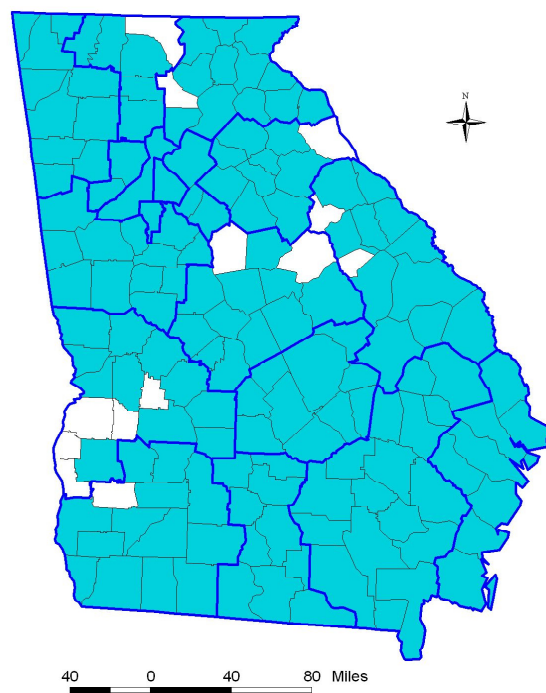
Culex quinquefasciatus, our primary WNV vector in Georgia, is a container-breeding mosquito that flies only a short distance from its breeding site when searching for a blood meal. Personal protection measures are ways in which the public can help reduce the risk of WNV for themselves and in their community. These include:

- Wearing repellent.
- Dumping out standing water at least once a week.
- Keeping grass cut, leaves raked, and vegetation trimmed.
- Applying larvicide to areas of standing water that cannot be dumped out or drained.
- Keeping gutters clear of debris.
- Picking up trash in yards and neighborhoods.
- Removing saucers from under outdoor potted plants.
- Keeping window screens repaired.
- Removing or covering all containers that may hold water.

WNV is now considered to be endemic throughout Georgia (Figure 2). However, lack of funding needed to collect mosquito population data and test vector species makes it difficult to predict human risk for any of the arboviruses currently found in Georgia or to help detect any newly introduced arboviruses. Continued monitoring of mosquitoes is our best course of action for reducing the incidence of arboviral diseases in Georgia. Information obtained from these surveillance efforts should lead to responsible and informed decisions about mosquito control as well as public education about reducing mosquito breeding in yards and neighborhoods and prevention of mosquito bites.

For more information regarding arbovirus activity in Georgia, please visit <http://health.state.ga.us/epi/vbd/mosquito.asp> or call 404-657-2588.

Figure 2: WNV-Positive Counties, 2001-2008, Georgia



2001-2008	human cases	horse case	mosquito pool	positive bird
total	227	303	628	1889
mean	28.4	37.9	78.5	236.1

Counties in Georgia with laboratory confirmed infections in WNV+ mosquitoes, birds, horses, or human cases reported between 2001-2008 (in blue).

Counties with no reported positives (in white) have done little to no surveillance; WNV is considered endemic in Georgia.

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Reported Cases of Selected Notifiable Diseases in Georgia, Profile* for December 2008

Selected Notifiable Diseases	Total Reported for December 2008	Previous 3 Months Total Ending in December			Previous 12 Months Total Ending in December		
	2008	2006	2007	2008	2006	2007	2008
Campylobacteriosis	37	129	147	116	580	693	689
<i>Chlamydia trachomatis</i>	2913	9270	0	8955	40010	0	42399
Cryptosporidiosis	22	81	47	75	281	240	263
<i>E. coli</i> O157:H7	0	6	14	8	43	49	44
Giardiasis	55	174	202	167	679	708	702
Gonorrhea	1190	4611	0	3632	20402	0	16184
<i>Haemophilus influenzae</i> (invasive)	21	35	35	39	123	128	149
Hepatitis A (acute)	4	12	13	12	56	69	57
Hepatitis B (acute)	18	44	37	51	198	157	187
Legionellosis	5	14	16	11	38	43	43
Lyme Disease	0	1	3	2	8	11	35
Meningococcal Disease (invasive)	0	6	5	2	20	24	18
Mumps	0	0	0	0	4	0	3
Pertussis	0	7	3	7	31	15	26
Rubella	0	0	0	0	0	0	0
Salmonellosis	132	458	611	542	1840	2033	2301
Shigellosis	40	597	458	219	1382	1647	1103
Syphilis - Primary	15	30	0	33	124	0	150
Syphilis - Secondary	72	130	0	185	482	0	763
Syphilis - Early Latent	31	93	0	110	385	0	557
Syphilis - Other**	75	236	0	275	1019	0	1342
Syphilis - Congenital	1	3	0	2	10	0	11
Tuberculosis	34	126	115	99	507	473	478

* The cumulative numbers in the above table reflect the date the disease was first diagnosed rather than the date the report was received at the state office, and therefore are subject to change over time due to late reporting. The 3 month delay in the disease profile for a given month is designed to minimize any changes that may occur. This method of summarizing data is expected to provide a better overall measure of disease trends and patterns in Georgia.

** Other syphilis includes latent (unknown duration), late latent, late with symptomatic manifestations, and neurosyphilis.

AIDS Profile Update

Report Period	Disease Classification	Total Cases Reported*			Percent Female	Risk Group Distribution %						Race Distribution %			
		<13yrs	>=13yrs	Total		MSM	IDU	MSM&IDU	HS	Unknown	Perinatal	White	Black	Hispanic	Other
Latest 12 Months	HIV, non-AIDS	13	2,964	2,977	26	31	2	1	4	62	<1	22	73	4	1
2/08-01/09	AIDS	1	1,897	1,898	25	30	2	1	6	61	<1	23	70	5	<1
Five Years Ago:**	HIV, non-AIDS	92	1,862	1,954	36	30	9	3	15	42	<1	20	76	3	1
02/04-01/05	AIDS	8	1,463	1,471	28	32	7	3	15	44	<1	18	77	4	<1
Cumulative:	HIV, non-AIDS	226	13,356	13,582	31	29	6	2	10	53	<1	21	74	4	1
07/81-01/09	AIDS	239	33,817	34,056	20	43	14	5	14	24	<1	30	67	3	<1

Yrs - Age at diagnosis in years

MSM - Men having sex with men

IDU - Injection drug users

HS - Heterosexual

* Case totals are accumulated by date of report to the Epidemiology Section ** Due to a change in the surveillance system, case counts may be artificially low during this time period

***HIV, non-AIDS was not collected until 12/31/2003